

Modern Concepts of Cardiovascular Disease

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DR. EMMET B. BAY, Chicago, *Editor*

DR. WRIGHT R. ADAMS, Chicago, *Associate Editor*

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THE TREATMENT OF CONGESTIVE HEART FAILURE IN THE HOME

There are several varieties of congestive heart failure which do not require hospital care but in which it is unwise for the patient to make the physical effort necessary to get to the doctor's office. The commonest one is the chronic failure so often seen in mitral stenosis with or without auricular fibrillation. These cases occur also as stages of other forms of heart disease, notably hypertensive cardiovascular disease, arteriosclerotic cardiovascular disease or coronary occlusion. In recent years the outlook for these patients has materially improved. Furthermore, the necessity for frequent house calls by the physician caring for these patients has considerably diminished. Some of the reasons for this improvement include better understanding of the use of digitalis or its preparations, the proper use of dietary measures, improvement in the use of theophylline derivatives and, lastly, the recent production of mercurial diuretics which can be administered by the patient himself.

Although digitalis has been in use off and on for about two hundred years, it is only in the last decade that we have learned about the extreme variations in dosage from patient to patient. We now know that the range of digitalizing dose is from 5 to 40 cat units and the range of the maintenance dose varies from 2 cat units per week to 2 cat units per day. The maintenance dose bears a direct relationship to the digitalizing dose but not to body weight or any other measurable factor. It is usually easy to digitalize a patient who has auricular fibrillation, especially if the patient has a rapid ventricular rate and has had no digitalis in the preceding three weeks. Here the slowing of the rate to levels between 70 and 90 by a given amount of digitalis, taken moderately rapidly, determines the maintenance dosage. There are a few patients, for example, who will get marked slowing on as little as 5 cat units. These patients derive benefit from 2 cat units a week, but may develop toxic symptoms on as little as 3 units a week. On the other hand, those who do not develop slowing of the rate until they have had something like 40 units will require somewhere between 10 and 14 units a week. There are all gradations between these two situations.

The average dose of the longer-acting preparations is 1 unit a day. It is sometimes desirable to experiment with the maintenance dose after it has been determined approximately. There are, for example, some patients whose sense of well-being is improved if they take 6 units a week instead of 7 and, contrariwise, some who feel better if they take 8 a week instead of 7. Once the maintenance dose for a given patient has been established it only rarely changes.

The patient with a normal mechanism presents a more difficult problem. These patients frequently benefit by a period of hospitalization before their care at home is undertaken. In these patients the

dose requirement has to be determined by the amount, given moderately rapidly, which initiates clinical improvement rather than by a change in the heart rate alone. The same range of dosage applies in these patients as in those with auricular fibrillation. One should try never to digitalize to the point of intoxication, but if inadvertently one does this, the dose which produced it can be used in determining the maintenance dose.

Some physicians believe that the powdered leaf is still the best preparation of digitalis now that it is uniformly biologically assayed. Others believe that one or another of the purified preparations of digitalis are more desirable because they can be gravimetrically prepared by pharmaceutical houses. For the moment it would appear to be wise for a physician to become familiar with one preparation and stick to it.

Theophylline and other similar compounds are useful in the treatment of dyspnea, orthopnea, Cheyne-Stokes respiration and acute left ventricular failure when given intravenously. Many of these are now available in the form of rectal suppositories. One is available in the form of a powder which can be used in a small retention enema. Patients with congestive heart failure being cared for at home frequently derive considerable benefit from these preparations which they may use themselves. Many such patients find that they can prevent attacks of nocturnal dyspnea by using one or another of these routinely at bed time.

There is a mercurial diuretic (thiomerin) not yet on the market which can be given subcutaneously without irritation. Patients can be taught to give themselves injections of this material much as other patients take insulin.

Many patients find that 0.5 cc. of thiomerin produces an excellent diuresis. Others require 1 cc. and a few get results only when 2 cc. are used. The smallest dose which will produce the desired effect is to be preferred. Patients in chronic heart failure taking care of themselves at home should be taught to weigh themselves every day at the same time of day, dressed in the same way. If they have been on a steady, non-weight-gaining diet and find that they have gained three or four pounds, they may use this as an indication for an injection of the drug. As with other mercurial diuretics, some patients find that they get better results if they take ammonium chloride in doses of from 4 to 6 gm. daily while using this material.

A few patients develop crampy abdominal pain for a few hours after an injection of thiomerin, but this has never been seriously discommoding. Two unintelligent patients produced abscesses at the site of injection. One of these was the result of a complete disregard for sterile precautions; the other

was the result of failure to keep the material in the refrigerator during the summer time.

The dietary treatment of congestive heart failure should be directed toward the control of three factors in all patients and of a fourth in some. The sodium ion content of the patient's intake, his protein requirement and his avoidance of gas-forming foods are important in all of these cases. A reducing diet is a "must" in those patients whose illness is complicated by obesity, especially if the latter developed after age thirty.

The sodium content of the diet can be reduced by the proper selection of foods and the restriction of the use of certain common remedies. In the case of the latter, sodium bicarbonate, sodium salicylate, sodium bromide, and any other medicine containing sodium in appreciable amounts should be avoided. Obviously, foods cooked with ordinary salt, baking powder or baking soda should be eliminated. Unfortunately, this list includes a large segment of the readily available food-stuffs; examples of these are bouillon cubes, bakery goods of all kinds, salted butter, cheese, practically all the condiments, crackers, canned, smoked or salt-water fish, all of the canned, smoked or salt-cured meats, olives and pickles, peanut butter, frankly salted foods such as pretzels, potato chips, pop corn, nuts, candies, many salad dressings and mayonnaise, self-rising flours and all vegetables that have been canned with the addition of salt. On the other hand, lemon juice, vinegar, pepper and nearly all of the herbs may be used for seasoning foods. Sweet butter may be used ad lib. if the patient does not require a reducing diet. Nearly all beverages are low in sodium content except carbonated water. Most of the cereals are permissible. Most fruits, canned or fresh, are free of large amounts of sodium. However, if salt or sodium benzoate has been added they should not be used. Practically all lean meat which has been prepared without the addition of salt constitutes an important daily item in these diets. Unsalted nuts may be added to those diets in which an increase in caloric content is desirable. Most of the vegetables except beets, spinach and carrots are permissible so far as their sodium content goes, but some of them have to be watched from the point of view of their gas-forming propensities.

Although it is extremely important to reduce the obese patient, it is equally important to maintain the caloric intake of the under-nourished patient who is in congestive heart failure. In some patients this is difficult to do on a diet low in sodium. However, with most patients there comes a time when the diet low in salt and similar substances becomes the natural or habitual one in such a way that they have an aversion to salty foods. Furthermore, in patients who have no complicating disease of the kidneys, liver, adrenals or other organs capable of modifying electrolyte balance in the body, these diets may be maintained for long periods without alteration in the blood sodium levels.

The ability of the sodium ion to play an important role in the retention of water by the body is unquestioned. In the presence of impending or real congestive heart failure its importance is second only to that of the proper use of digitalis. The difficulties inherent in getting patient cooperation in the home on this regime cannot be over-stressed. It is com-

paratively easy to secure real cooperation on the part of the intelligent patient, but even here the modification of his way of life is so onerous as to make the risk of the development of an exaggerated, self-imposed heart consciousness very high. This part of the dietary regime is so important, however, that it is worth while to stress it above all other metabolic considerations.

Next in importance in the patient's diet is to make sure that his protein intake is adequate. Some of these victims of chronic passive hyperemia of the liver have reduced plasma proteins, although this is not so true as speculation would dictate. In any case, it is clear that by preference they should have something more than the minimal protein intake suggested by all nutrition studies available to date. This would suggest that a real effort should be made to get more than one gram of protein per kilogram of body weight per 24 hours for all of them.

The enlargement of the liver and edema of the bowel wall so characteristic of chronic congestive heart failure render some patients who previously had "cast-iron stomachs" susceptible to gas-forming foods. A few of them can tolerate many of the foods which are notoriously likely to produce extra gas. Most of them will benefit by a diet in which the worst offenders in this category are eliminated. These include such things as cabbage, cauliflower, navy beans, onions, cucumbers, radishes and, to a less extent, broccoli, other forms of the bean family, celery, corn and peppers.

The patient in the middle or older age group who is suffering from congestive heart failure and who is frankly obese or who has gained even a relatively small amount of weight after he was thirty years of age will frequently benefit by a reducing diet as part of his treatment. This is one of the most difficult regimes to impose with lasting cooperation on the part of the patient. Nevertheless, in the statistically changing prognosis of congestive heart failure there is no one group in which the outlook has improved so much as in those patients who were faithful to a reducing diet in the presence of a pre-existing obesity and a current hypertensive, arteriosclerotic or "coronary" heart disease.

In summary, it may be said that it is now possible to care for many patients with congestive heart failure in their own homes without protracted, expensive hospitalization and without frequent house calls by the physician. The life expectancy of many of these individuals suffering from heart failure, from almost whatever cause, has been greatly prolonged in the past fifteen years by improved knowledge of the use of digitalis, quick-acting theophylline and mercurial diuretic drugs which can be self-administered, and newer knowledge about the role of the sodium ion in the retention of body water. The role that this knowledge may play in curtailing the duration of hospitalization and in the number of house calls made by physicians in any future plan for the practice of medicine in this country is unforeseeable. It is the hope of the writer that it will make possible the care of more patients by fewer physicians in a way that will help to forestall the inevitably wasteful socialization of medicine.

Emmet B. Bay, M.D.
Chicago, Illinois

ERRATUM

In *Heart Disease and Pregnancy, Part I, January 1949, p. 30, para. 3, "the viscosity of the blood . . . factors" is in error and should be deleted.*

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